

WHAT IS CLAIMED IS:

1                   1.       A medical method for detecting and treating inadequate tissue  
2 perfusion of a patient, comprising:  
3                   providing a sensor for measuring an intravascular blood parameter;  
4                   positioning the sensor on a portion of the patient's vasculature;  
5                   measuring the intravascular parameter using the sensor;  
6                   detecting inadequate tissue perfusion based on the intravascular parameter  
7 measured by the sensor;  
8                   delivering a stimulus to increase tissue perfusion as a function of the measured  
9 intravascular parameter.

1                   2.       A medical method as in claim 1, wherein the sensor measures blood  
2 pressure, and wherein the sensor is positioned on a blood vessel.

1                   3.       A medical method as in claim 2, wherein the sensor includes a  
2 transducer and a catheter, wherein the catheter extends through a wall and inside a lumen of  
3 the blood vessel and the transducer resides outside the blood vessel.

1                   4.       A medical method as in claim 1, wherein the sensor measures blood  
2 flow rate, and wherein the sensor is positioned on a blood vessel.

1                   5.       A medical method as in claim 1, wherein the sensor is positioned on an  
2 artery.

1                   6.       A medical method as in claim 1, wherein the sensor is positioned on an  
2 vein.

1                   7.       A medical method for detecting and treating inadequate tissue  
2 perfusion of a patient, comprising:  
3                   providing a sensor for measuring intracardiac pressure;  
4                   positioning the sensor in or on the patient's heart;  
5                   measuring intracardiac pressure of the left side of the patient's heart using the  
6 sensor;  
7                   detecting inadequate tissue perfusion based on the intracardiac pressure  
8 measurement;

9 delivering a stimulus to increase tissue perfusion as a function of the  
10 intracardiac pressure measurement.

1 8. A medical method as in claim 7, wherein the measured intracardiac  
2 pressure comprises left atrial pressure.

1 9. A medical method as in claim 7, wherein the measured intracardiac  
2 pressure comprises left ventricular pressure.

1 10. A medical method as in claim 7, wherein the sensor is positioned on a  
2 chamber wall.

1 11. A medical method as in claim 10, wherein the chamber wall comprises  
2 a septal wall.

1 12. A medical method as in claim 10, wherein the chamber wall comprises  
2 a free wall.

1 13. A medical method as in claim 10, wherein the sensor includes a  
2 transducer and a catheter, wherein the catheter extends through the chamber wall into a  
3 cardiac chamber and the transducer resides outside the chamber.

1 14. A medical method as in claim 13, wherein the sensor is connected to a  
2 pacing electrode and the pacing electrode contacts the chamber wall.

1 15. A medical method for detecting and treating inadequate tissue  
2 perfusion of a patient, comprising:  
3 providing a sensor for measuring tissue perfusion;  
4 providing a therapeutic device for delivering a stimulus to increase tissue  
5 perfusion;  
6 positioning the sensor in the patient remote from the therapeutic device;  
7 measuring tissue perfusion using the sensor;  
8 detecting inadequate tissue perfusion based on the tissue perfusion  
9 measurement; and  
10 delivering a stimulus to increase tissue perfusion as a function of the tissue  
11 perfusion measurement.

1                   16.     A medical method as in claim 15, wherein the sensor is positioned  
2 adjacent vascularized tissue and measures blood flow in the vascularized tissue.

1                   17.     A medical method as in claim 16, wherein the sensor measures blood  
2 flow in capillaries in the vascularized tissue.

1                   18.     A medical method for treating a patient, comprising:  
2 detecting heart rate as an indicator of inadequate tissue perfusion;  
3 detecting at least one other indicia of inadequate tissue perfusion;  
4 delivering a stimulus to increase tissue perfusion as a function of both heart  
5 rate and the at least one other indicia.

1                   19.     A medical method as in claim 18, further comprising providing a  
2 therapeutic device for delivering the stimulus to increase tissue perfusion.

1                   20.     A medical method as in claim 19, wherein the step of delivering the  
2 stimulus comprises delivering a stimulus to increase heart rate.

1                   21.     A medical method as in claim 20, wherein the step of providing a  
2 therapeutic device comprises providing a pacemaker, and wherein the step of delivering the  
3 stimulus to increase heart rate comprises delivering electrical impulses to the patient's heart.

1                   22.     A medical method as in claim 20, wherein the step of providing a  
2 therapeutic device comprises providing an infusion pump, and wherein the step of delivering  
3 the stimulus to increase heart rate comprises delivering a bolus of a drug.

1                   23.     A medical method as in claim 20, wherein the step of detecting at least  
2 one other indicia of inadequate tissue perfusion comprises detecting blood pressure.

1                   24.     A medical method as in claim 23, wherein the step of detecting blood  
2 pressure comprises detecting vascular blood pressure.

1                   25.     A medical method as in claim 23, wherein the step of detecting blood  
2 pressure comprises detecting intracardiac blood pressure.

1                   26.     A medical method as in claim 20, wherein the step of detecting at least  
2 one other indicia of inadequate tissue perfusion comprises detecting blood flow.

1                   27.     A medical method as in claim 26, wherein the step of detecting blood  
2     flow comprises detecting vascular blood flow.

1                   28.     A medical method as in claim 20, wherein the step of detecting at least  
2     one other indicia of inadequate tissue perfusion comprises detecting blood perfusion in tissue.

1                   29.     A medical method as in claim 28, wherein the step of detecting blood  
2     perfusion in tissue comprises detecting blood perfusion in tissue in the patient's upper body.

1                   30.     A medical method as in claim 28, wherein the step of detecting blood  
2     perfusion in tissue comprises detecting blood perfusion in tissue in the patient's chest.

1                   31.     A medical method as in claim 28, wherein the step of detecting blood  
2     perfusion in tissue comprises detecting blood perfusion in tissue in the patient's head or neck.

1                   32.     A medical method, comprising:  
2                   providing an implantable therapeutic device (ITD) configured to deliver a  
3     stimulus to increase heart rate;  
4                   providing an implantable pressure sensing device (PSD) including a  
5     hermetically sealed housing, a pressure transducer disposed in the housing, a pressure  
6     transmission catheter (PTC) having a proximal end, a distal end, and a lumen extending  
7     therethrough, with the proximal end of the PTC connected to the housing and the lumen of  
8     the PTC in fluid communication with the pressure transducer;  
9                   implanting the ITD in a patient;  
10                  implanting the PSD in the patient such that the distal end of the PTC resides in  
11     a vascular lumen and the housing remains outside the vascular lumen;  
12                  connecting the PSD to the ITD via an electrical lead; and  
13                  operating the ITD to deliver the stimulus to increase heart rate in response to a  
14     drop in blood pressure as measured by the PSD.

1                   33.     A method as in claim 32, wherein the pressure transducer of the PSD  
2     converts a pressure signal to an electrical signal, and wherein the ITD includes a signal  
3     processor which evaluates the electrical signal for hypotension.

1                    34.     A method as in claim 33, wherein the lumen of the PTC is filled with a  
2 fluid and a barrier is disposed in a distal end of the PTC lumen to contain the fluid while  
3 permitting pressure to be transferred therethrough.

1                    35.     A method as in claim 32, wherein the ITD delivers an electrical  
2 stimulus.

1                    36.     A method as in claim 32, wherein the ITD delivers a pharmacological  
2 stimulus.